ORIGINAL RESEARCH

Use of Aspirin for Primary and Secondary Cardiovascular Disease Prevention in the United States, 2011–2012

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***Background*—**Aspirin use has been shown to be an effective tool in cardiovascular disease (CVD) prevention among high-risk patients. The patient-reported physician recommendation for aspirin as preventive therapy among high- and low-risk patients is unknown.

***Methods and Results*—**We conducted an analysis of the National Health and Nutrition Examination Survey 2011–2012 to examine the use of aspirin for CVD prevention. Patients without previously diagnosed CVD were classified into high and low risk based on their Framingham Risk Score (10-year coronary heart disease risk). Among patients without previously diagnosed CVD, 22.5% were classified as high risk. Of the high-risk individuals, 40.9% reported being told by their physician to take aspirin, with 79.0% complying. Among those who were at low risk, 26.0% were told by their physician to take aspirin, with 76.5% complying. Logistic regression analysis indicated that age, access to a regular source of care, education, and insurance status were significant predictors of patient-reported physician recommendations for aspirin use for primary prevention. Among high-risk patients, age, race, and insurance status were significant predictors of reported recommendations for aspirin use. Among low-risk patients, age, education, obesity, and insurance status were significant predictors of reported recommendations for aspirin use.

***Conclusions*—**Patient reports indicate nonideal rates of being told to take aspirin, for both high- and low-risk patients for primary prevention. Clinical decision support tools that could assist physicians in identifying patients at risk may increase patient reports of physician recommendations for aspirin use. **(*J Am Heart Assoc*. 2014;3:e000989 doi: 10.1161/JAHA.114.000989)**

Key Words: aspirin • cardiovascular diseases • prevention

Cardiovascular disease (CVD) is the leading cause of death in the United States. In 2010, CVDs killed over 700 000 Americans, and accounted for 29.4% of total deaths.[1] Moreover, CVD accounts for a significant portion of the financial burden of medical care, costing >$312.6 billion in healthcare spending and lost productivity in 2010.[2] Aspirin therapy is a prevention measure that can reduce the risk of major cardiovascular events such as heart attack and stroke,[3] and is recommended by the US Preventive Services Task Force to prevent heart attack and ischemic stroke.[4] Aspirin is used as a primary prevention measure to aid in the prevention of a first occurrence of CVD.[5,6] It can also be used as a secondary prevention measure among individuals who have experienced a heart attack or stroke to prevent additional cardiovascular events.[7] The American Heart Association recommends the use of low-dose aspirin daily for people at high risk of a heart attack and regular use of low-dose aspirin for heart attack survivors.[5]

A variety of studies have examined whether individuals at risk of having a heart attack in the United States were taking aspirin.[8–10] However, many of these studies failed to ascertain whether a person was recommended to take aspirin by their physician or whether they were taking it on their own initiative. Thus, these studies may be not an accurate assessment of physician recommendations for aspirin use. Further, much of the past research has used various risk factors to determine whether people were at high risk of CVD, rather than using the Framingham Risk Score (FRS) as recommended by the US Preventive Services Task Force in 2009,[11] the 2010 American Diabetes Association/American Heart Association/American College of Cardiology recommendations,[12] and the 2008 American College of Chest Physician guidelines.[13]

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Prevention of CVD events is particularly important, and understanding physician recommendations for aspirin therapy is critical for delivering quality health care. Our current understanding of who is being encouraged to take aspirin for CVD prevention is limited. We sought to evaluate patient use of aspirin and reported physician recommendations of aspirin therapy for CVD prevention, in a nationally representative sample.

Methods

We analyzed the National Health and Nutrition Examination Survey (NHANES) for the years 2011–2012. The NHANES is a large, nationally representative survey. The NHANES samples the noninstitutionalized population of the United States by using a stratified multistage probability sample design. The National Center for Health Statistics uses a multilevel weighting system to account for survey design and nonresponse. This allows the study to provide nationally representative population estimates of the United States. The current study is focused on adults 40 years of age and older, because the NHANES asked this sequence of questions about aspirin use only to adults aged 40 and older. NHANES data are de-identified public-use data that are not considered human subjects research.

Aspirin Recommendations and Use

The respondents were asked if their doctor recommended that they take low-dose aspirin for prevention of CVD, stroke, or cancer. Individuals who reported a recommendation to take aspirin were also asked if they were following this advice. “Low dose” is not defined in the question. Individuals who did not report a recommendation to take aspirin were asked if they were taking low-dose aspirin on their own. For the purposes of this analysis, these individuals were combined with those who were taking aspirin on their physician’s recommendations, in order to get a better understanding of who is taking aspirin.

Primary and Secondary CVD Risk

Individuals who had never been told by a physician that they had a stroke or heart attack were considered candidates for primary prevention. Their eligibility for guideline-recommended use of aspirin was based on the assessment of their risk for coronary heart disease (CHD). High risk for CHD was classified as having a 10-year CHD risk of >10% according to the FRS with no history of heart attack or stroke. Low risk for CHD was considered a risk of ≤10% according to the FRS with no history of heart attack or stroke as stated in the 2010 American Diabetes Association/American Heart Association/American College of Cardiology guidelines.[12]

The FRS was calculated according to published guidelines in the literature.[14,15] The FRS utilizes gender, age, total cholesterol, high-density lipoprotein cholesterol, systolic blood pressure, use of blood pressure medications, and smoking status. For NHANES participants, total cholesterol was available through the laboratory testing results. Systolic blood pressure was calculated by averaging 3 readings taken during the medical examination portion of the NHANES. Smoking status was defined as whether or not the respondent was currently smoking. The scores were grouped into 2 categories for this analysis: low risk (having a 10 year risk of heart attack be < 10% on the Framingham Risk Calculator) and high risk (10% or above). For people with diabetes (defined as having been told by a physician that the respondent had diabetes [excluding gestational diabetes]), as per the American Diabetes Association/American Heart Association/American College of Cardiology guidelines, individuals scoring <5% were considered low risk, and individuals scoring >10% were considered high risk. Individuals with diabetes who had an intermediate risk score between 5% and 10% were removed from the analysis because there is no firm guideline for this group regarding aspirin use from the American Diabetes Association/American Heart Association/American College of Cardiology guidelines. We did, however, examine whether there were differences in being told to take aspirin and whether they were taking it, and how they compared to low- and high-risk diabetes patients.

Individuals who reported that a doctor had previously told them that they had been diagnosed with a stroke or a heart attack were candidates for secondary prevention.

Obesity Status

Although obesity is not a specific characteristic that would justify a recommendation of aspirin for primary prevention, it is possible that both patients and physicians may interpret the CVD risk inherent in obesity as justifying aspirin. Height and weight were measured during the NHANES physical examination of the participants. Body mass index was calculated as weight (kg)/h (m^2). Obesity was classified as a body mass index of 30 or above.

Risk of Gastrointestinal Bleeding

The NHANES 2011–2012 does not ask questions regarding history of peptic ulcer or other gastrointestinal conditions that could increase risk of bleeding. It does, however, collect information about stomach cancer, a condition for which aspirin use is contraindicated. To control for this, we removed individuals with a history of stomach cancer from the analysis.

Demographics and Access to Care

Age was self-reported and divided into 2 categories: 40 to 64 and 65 and older. Race/ethnicity was also self-reported and was categorized as non-Hispanic whites, non-Hispanic blacks, Hispanics, and Asians/other. We examined the highest level of completed education. Education was examined because of its potential impact on self-initiation of aspirin use. As having access to care may affect whether patients receive appropriate care for ambulatory-sensitive conditions including diabetes and CVD, we examined both whether the respondent had health insurance and a regular source of health care. Insurance status was defined as whether or not the individual reported having health insurance, of any form, at the time of the interview. Regular access to care was defined by whether the respondent reported having a place to regularly go to receive health care.

Analysis

The NHANES uses a stratified multistage probability sample design. To account for this complex design, we used SUDAAN 11 for all data analysis. The analysis utilized the nesting capability in SUDAAN with variables provided in NHANES (that account for stratum level differences and primary sampling unit differences) for all analysis, along with the appropriate weight identified by National Center for Health Statistics for the type of data being used in our analysis. Utilizing these weights and sampling design variables allows us to account for the complexity of the sampling design in performing univariate analyses, χ^2 tests, and logistic regression models and make population estimates for the noninstitutionalized adult population of the United States.

We examined obesity status, demographics, and access to care characteristics of the respondents. We also examined the bivariate relationship between being told to take aspirin/taking aspirin on doctor's orders/taking aspirin on their own with the individual's high/low risk for CHD based on FRS/previous diagnosis of diabetes using χ^2 tests to test for significant differences. We examined both primary prevention (those who have not been told by their physician that they have had either a stroke and/or heart attack) and secondary prevention (have been told by their physician that they have had either a heart attack or stroke). We examined the bivariate relationship between being told to take aspirin and taking aspirin with risk level using χ^2 tests to test for significant differences. We also conducted separate analyses stratified by race using χ^2 tests to examine the impact of race on other independent variables as well as on the outcome variables. Bivariate estimates for stratifying secondary prevention by heart attack or stroke were examined, but the sample size was too small for stratified estimates to produce reliable estimates. All bivariate calculations used the standard method of pairwise deletion to account for missing data.

We computed forced-inclusion logistic regression to examine the relationship of risk status, age, gender, race, education level, obesity status, having insurance, and having a regular source of care on the likelihood of whether patients were told to take aspirin by their physicians. We conducted the regression for the primary prevention sample and again separately for individuals at high and low risk. We were unable to conduct logistic regressions for individual racial/ethnic groups because the sample size was too small to generate reliable estimates. We used listwise deletion of missing cases for the regression analysis. We also conducted tests for multicollinearity of risk status (based on the FRS) with obesity, age, and gender. Specifically, we computed Spearman's correlations as well as examined the tolerance and variance inflation factors of independent variables in the regressions. The FRS uses gender and age as variables in its construction, and obesity is a known risk factor for CVD. We detected no evidence of multicollinearity.

Results

A total of 3435 individuals answered questions about aspirin use, representing 142 677 272 Americans. Demographic characteristics of the sample, primary prevention group, low-risk primary-prevention group, and high-risk primary-prevention group are shown in Table 1.

Physician Recommendations for Aspirin for Primary Prevention

Table 1 shows that among the total sample eligible for aspirin as primary prevention, less than a third reported being recommended by their doctor to take aspirin. Table 1 also indicates that over three fourths of primary-prevention patients were classified as low risk. Less than half of the primary-prevention patients who had a high CHD risk level received a recommendation to take aspirin while >one fourth of low-risk patients were also recommended to take aspirin (Table 1).

Of those told to take aspirin by their physicians, the vast majority complied with the recommendation. Specifically, 77.4% of the total sample, 79.0% of the high-risk patients, and 76.5% of the low-risk patients reported taking aspirin (Table 1).

Table 2 shows the bivariate relationships between the demographic variables, health insurance, having a regular place to go for health care, and having a diabetes diagnosis and being told by the physician to take aspirin as primary prevention. Analysis examining differences between low-, intermediate-, and high-risk diabetes showed that among low-risk diabetes patients, 54.6% were told to take aspirin, compared to 72.8% of intermediate-risk diabetes patients and

Table 1. Characteristics of Individuals Eligible for Primary Prevention, Individuals at High Risk, and Individuals at Low Risk

	Total Eligible for Primary Prevention, %	Individuals at High Risk, %	Individuals at Low Risk, %
Sample size	3079	787	2081
Weighted sample size	130 712 830	30 068 989	93 732 306
Gender			
Male	46.6	88.4	32.4
Age group, y			
65+	68.5	89.4	60.9
Race			
Non-Hispanic white	71.6	75.3	71.3
Non-Hispanic black	10.5	8.2	10.8
Hispanic	11.0	10.8	10.9
Asian/other	6.8	5.7	7.0
Education			
More than high school	61.5	56.0	63.4
Obesity			
Obese	36.7	37.0	35.8
Insurance			
Has insurance	85.1	86.5	84.5
Regular source of care			
Has a regular source of care	90.1	88.4	90.5
Diabetes			
Has diabetes	12.6	16.8	8.0
Risk level			
High risk	22.5	NA	NA
Aspirin usage			
Told by physician to take aspirin	31.2	40.9	26.0
Taking aspirin based on physician recommendation	77.4	79.0	76.5

NA indicates not applicable.

56.2% of high-risk diabetes patients ($P = 0.17$). Further analyses by diabetes risk were impossible due to small sample size.

Taking Aspirin, Primary Prevention

Table 3 presents bivariate relationships among respondents who were taking aspirin after having received a recommendation to do so by their physician. In an additional subanalysis, there were no statistically significant differences for taking aspirin for low-, intermediate-, and high-risk diabetes patients, with 51.5% of low-risk diabetes patients taking aspirin, 42.2% of intermediate-risk diabetes patients taking aspirin, and 47.1% high-risk diabetes patients taking aspirin ($P = 0.53$).

Impact of Race and Differences in Aspirin Recommendations and Demographics

There were a number of significant differences in demographic and access-to-care variables by race/ethnic group among primary-prevention patients, as shown in Table 4.

Secondary Prevention

Of the 8.3% of the total sample eligible for secondary prevention, 75.9% were told to take aspirin by their physician. Of those who were told by their physicians to take aspirin, 89.9% were taking aspirin.

Predictors of Physician Recommendation to Take Aspirin

Table 5 shows the results of 3 logistic regression models for being told to take aspirin among individuals eligible for primary prevention, only individuals at high risk, and only individuals at low risk. The logistic regression examining all patients without a history of heart attack or stroke that included risk level as an independent variable indicated that the FRS was not predictive of receiving a physician recommendation for aspirin. Among all primary-prevention patients, education level, insurance status, and having a regular source of care were predictive of receiving a recommendation for aspirin for CVD prevention. Among high-risk individuals, age, health insurance, and being of Asian/other descent were predictive of receiving a recommendation for aspirin for CVD prevention. Among low-risk individuals, age, health insurance status, education level, and obesity status were all predictive of receiving a recommendation for aspirin therapy.

Discussion

The results of this study indicate that recommendations for aspirin for CVD prevention do not match up to the objectively computed future risk. For individuals at high risk, fewer than half report receiving recommendations for aspirin. Moreover, in a multivariate analysis, objective risk level was not associated with an increased risk of recommendation for aspirin. This suggests that decisions for treatment recommendations seem

Table 2. Bivariate Results for Patients Told to Take Aspirin, for Individuals Eligible for Primary Prevention, Individuals at High Risk, and Individuals at Low Risk

	Total Eligible for Primary Prevention, %	*P* Value	Individuals at High Risk, %	*P* Value	Individuals at Low Risk, %	*P* Value
Sample size	3079		787		2081	
Weighted sample size	130 712 830		30 068 989		93 732 306	
Gender		0.20		0.05		0.06
Male	32.8		39.4		23.6	
Female	29.9		53.3		27.2	
Age group, y		<0.0001		0.001		<0.0001
40 to 64	11.0		17.0		9.1	
65+	40.6		43.8		36.9	
Race		0.06		0.08		0.12
Non-Hispanic white	33.0		42.5		27.8	
Non-Hispanic black	30.1		43.0		24.6	
Hispanic	24.9		36.4		19.3	
Asian/other	24.5		26.7		20.3	
Education		0.20		0.61		0.30
High school or less	33.4		42.1		28.0	
More than high school	29.9		40.1		24.9	
Obesity		0.20		0.68		0.13
Obese	33.9		39.3		29.2	
Not obese	29.7		41.9		24.3	
Insurance		<0.0001		<0.0001		<0.0001
Has insurance	34.1		44.6		28.4	
Does not have insurance	15.1		17.6		12.9	
Regular source of care		<0.0001		0.0003		0.0002
Has regular source of care	33.2		44.1		27.4	
Does not have regular source of care	13.7		17.2		12.7	

to be being made on criteria other than objectively calculated future CHD risk. This would lead to undertreating some patients who would benefit and overtreating other patients. Only 40.9% of patients at high risk reported having been told by their physician to take aspirin. Patient reports of recommendations for aspirin use among secondary prevention patients was 75.9%, but still suboptimal. Respondents who were at low risk of developing CVD and had body mass indexes over 30 were more likely to be told to take aspirin for primary prevention than normal-weight patients. The benefit of using aspirin in low-risk patients who do not have clinical CVD is negated by the risk of harms from gastrointestinal bleeding.[16]

It is possible that the seemingly suboptimal rates of recommendations to take low-dose aspirin are the result of the provider weighing the benefits of aspirin against the very real risks of upper gastrointestinal bleeding. Lin et al[17] have shown that the risk of upper gastrointestinal bleeding is 90% higher among low-dose aspirin users who are using aspirin for primary prevention compared to nonusers and 40% higher for secondary-prevention patients. The number needed to harm per 1 year of low-dose aspirin use was 601 for primary-prevention patients and 391 for secondary-prevention patients.[17] Patients with a history of upper gastrointestinal bleeding and peptic ulcers also have a higher incidence of upper gastrointestinal bleeding,[18] as do patients with concomitant use of clopidogrel or nonsteroidal anti-inflammatory drugs.[19] All of these factors may have contributed to the lack of recommendations for aspirin use to high-risk patients.

The results of the secondary-prevention analysis should be interpreted cautiously. First, NHANES does not account for hemorrhagic stroke (≈13% of all strokes)[20] and aspirin use would be inappropriate for these patients. Second, secondary-prevention patients could be taking other blood thinners that would obviate the need for low-dose aspirin. In order to better

Table 3. Bivariate Results for Taking Aspirin Among Respondents Told by Their Physicians to Take Aspirin, for Individuals Eligible for Primary Prevention

	Total Eligible for Primary Prevention, %	*P* Value
Sample size	3079	
Weighted sample size	130 712 830	
Gender		0.12
Male	74.4	
Female	80.3	
Age group, y		0.009
40 to 64	57.6	
65+	79.9	
Race		0.03
Non-Hispanic white	78.7	
Non-Hispanic black	79.3	
Hispanic	67.5	
Asian/other	72.4	
Education		0.26
High school or less	74.7	
More than high school	79.3	
Obesity		0.59
Obese	78.3	
Not obese	76.8	
Insurance		0.04
Has insurance	78.6	
Does not have insurance	62.9	
Regular source of care		0.61
Has regular source of care	77.6	
Does not have regular source of care	74.7	
Risk level		0.54
High risk	79.0	
Low risk	76.5	

understand physician prescribing practices of aspirin and patient usage of aspirin, additional research of aspirin use in the context of other antiplatelet and anticoagulant use is needed.

The apparent disconnect between risk for future CVD and aspirin recommendations may benefit from improved clinical decision support. Helping to compute the actual risk rather than simply identifying general risk factors should aid in making accurate decisions.[21] Actual risk could be computed in electronic health records, which could also provide the physician with the recommendation for treatment. In addition, such tools could provide other affiliated treatment recommendations such as use of gastric-protective agents in select patient populations.

In addition to a significant disconnect between who needs and who receives recommendations for aspirin use, the analysis indicated a persistent problem with access to care and receipt of recommendations for aspirin use. Lack of health insurance can be a significant barrier to accessing health care, especially for preventive services.[22–24] These results reinforce the pervasiveness of access problems when individuals lack health insurance. Previous research has found no relationship between insurance status and aspirin use among patients who accessed clinical preventive services.[25,26] These results suggest that access to care may play a role in recommendations for the advice of aspirin for CVD prevention, and the use of it by patients. The present results may differ from previous studies in that the previous studies did not assess whether the provider recommended aspirin for CVD prevention.

Race and ethnicity did have an impact among primary-prevention patients, with non-Hispanic whites more likely to receive a recommendation for aspirin than were Asians/others. Additional analyses indicated that among primary-prevention patients, a greater percentage of non-Hispanic whites had health insurance compared with other racial/ethnic groups. As with curative medical care, the ability to access preventive medical care is in large part influenced by insurance status. Therefore, part of the racial/ethnic disparities in primary prevention that we observed are possibly attributable to lack of health insurance and a usual source of care.

That a higher level of education for primary-prevention and low-risk patients was predictive of lower likelihood of receiving a recommendation for aspirin was somewhat surprising, particularly that the finding emerged after controlling for race, age, gender, obesity, insurance status, and access to a regular source of care. It is possible that physicians may perceive more highly educated people as having a lower risk of heart disease, based on the known connection between educational attainment and health outcomes.[27–30]

There are limitations to this study. This investigation relies on self-report of whether or not an individual's doctor recommended aspirin as prevention of heart attack, stroke, and cancer, as well as self-report of a number of variables for analysis. Self-reported data are very common in studies of health behaviors, but there are questions regarding the reliability of the data. Patient self-report can be unreliable, especially regarding behaviors and risk factors relevant to CVD and cancer.[31] The present study has several strengths in dealing with the issue of self-report. The National Center for Health Statistics conducts rigorous testing of its survey instruments to ensure validity through the Questionnaire

Table 4. Bivariate Results for Demographic Differences by Race, for Individuals Eligible for Primary Prevention

	Non-Hispanic White, %	Non-Hispanic Black, %	Hispanic, %	Asian/Other, %	*P* Value
Sample size	1133	857	608	481	
Weighted sample size	93 625 236	13 762 732	14 394 184	8 930 677	
Gender					0.41
Male	47.1	43.7	47.9	44.3	
Age group, y					0.002
65+	71.6	64.9	55.9	61.0	
Education					0.0008
More than high school	67.2	51.4	32.6	63.7	
Obesity					<0.0001
Obese	35.6	48.5	44.2	18.7	
Diabetes status					<0.0001
Has diabetes	10.5	20.4	17.1	15.6	
Insurance					0.0001
Has insurance	88.9	83.8	64.9	78.7	
Regular source of care					0.004
Has regular source of care	91.7	90.8	80.6	87.5	
Risk level					0.02
High risk	25.3	19.5	24.2	20.8	
Aspirin usage					
Taking aspirin based on physician recommendation	78.6	79.2	67.5	72.4	0.03

Design Research Laboratory, ensuring that all questions utilized are of high reliability and validity. In addition, lab and physical examination values were used when possible to minimize bias introduced by self-report.

An additional limitation is that the study only examines adults age 40 and over, as this is the only group that NHANES asks about aspirin use. There could be important patterns of use among younger individuals that this analysis cannot look for. Another limitation of this study is that we do not know how many respondents were recommended to take aspirin for heart attack or stroke prevention versus for cancer prevention. NHANES groups all 3 conditions under the same question. Thus, it is possible that some proportion of aspirin recommendations may be for cancer prevention, rather than heart attack or stroke prevention. However, the US Preventive Services Task Force currently recommends against the use aspirin for the prevention of cancer,[32] thereby suggesting that recommendations to take aspirin based on cancer prevention should be unlikely. In addition, this study did not control for use of warfarin or other anticoagulant/antiplatelet therapy among respondents. Anticoagulant use could explain some of the deficit in the use and recommendations to take aspirin among primary-prevention patients. Finally, because of limitations in what information is collected by the NHANES, we do not know what role the risk of gastrointestinal bleeding played in the decision of physicians to recommend aspirin. Gastrointestinal bleeding is a significant issue that we would expect to have an impact on the likelihood of a physician recommending aspirin use for patients who may otherwise benefit from it. We did remove individuals with a history of stomach cancer for our analysis. The available data from NHANES do not allow us to elucidate who is at greater risk for gastrointestinal bleeding and for whom a recommendation to take aspirin would be inappropriate.

Conclusions

In conclusion, patients report nonideal rates of being recommended to take aspirin. High-risk patients who are not receiving the recommendation are put at increased risk of CVD events. Low-risk patients are exposed to adverse risk with unnecessary use of aspirin based upon a physician's recommendation. It is clear that quality of care for primary prevention falls far short of ideal. Further research on clinical decision support systems and interventions designed

Table 5. Logistic Regression Results Predicting Aspirin Recommendation for Individuals Eligible for Primary Prevention, Individuals at High Risk, and Individuals at Low Risk

	Total Eligible for Primary Prevention OR (95% CI)	Individuals at High Risk OR (95% CI)	Individuals at Low Risk OR (95% CI)
Sample size	2863	785	2078
Weighted sample size	123 654 331	29 989 307	93 665 024
Risk level			
High risk	1.26 (0.99 to 1.60)	—	—
Low risk	1	—	—
Gender			
Male	1	1	1
Female	0.86 (0.68 to 1.09)	1.46 (0.84 to 2.57)	0.76 (0.59 to 1.00)
Age group, y			
40 to 64	1	1	1
65+	5.29 (3.64 to 7.69)	3.30 (1.14 to 9.61)	5.92 (3.58 to 9.79)
Race			
Non-Hispanic white	1	1	1
Non-Hispanic black	0.93 (0.76 to 1.14)	1.07 (0.70 to 1.63)	0.88 (0.68 to 1.13)
Hispanic	0.88 (0.62 to 1.23)	1.01 (0.62 to 1.66)	0.82 (0.53 to 1.27)
Asian/other	0.77 (0.47 to 1.25)	0.52 (0.32 to 0.87)	0.86 (0.45 to 1.66)
Education			
High school or less	1	1	1
More than high school	0.74 (0.60 to 0.92)	0.80 (0.50 to 1.29)	0.76 (0.58 to 0.98)
Obesity			
Obese	1.20 (0.93 to 1.55)	0.80 (0.50 to 1.29)	1.43 (1.05 to 1.96)
Not obese	1	1	1
Insurance			
Has insurance	2.22 (1.46 to 3.38)	2.28 (1.20 to 4.33)	2.21 (1.39 to 3.51)
Does not have insurance	1	1	1
Regular source of care			
Has a regular source of care	2.09 (1.24 to 3.5)	2.80 (0.94 to 8.33)	1.78 (1.00 to 3.18)
Does not have a regular source of care	1	1	1

OR indicates odds ratio.

to reinforce the use of appropriate risk calculation is necessary to ensure that patients receive appropriate preventive care.

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Disclosures

None.

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